

Amendments to the Claims:

Claims 1-16 (Cancelled).

17. (Currently Amended) An optical device comprising:

~~an optical~~ a quartz substrate;

a projecting part formed of a photosensitive resin material cured by exposure to light, said projecting part being attached to said quartz substrate;

a lens element formed on said ~~optical~~ quartz substrate;

an optical element; and

a supporting substrate supporting said optical element, said supporting substrate having a grooved surface with a groove formed therein;

wherein said ~~optical substrate has a~~ projecting part ~~resting~~ attached to said quartz substrate rests within said groove formed in said grooved surface of said supporting substrate so as to align said lens element with said optical element.

18. (Previously Presented) A method of fabricating the optical element of claim 17, comprising:

using photolithography to define said projecting part; and

using photolithography to define said groove formed in said grooved surface of said supporting substrate.

19. (Currently Amended) The optical device of claim 17, wherein said groove formed in said grooved surface comprises a first groove, said supporting substrate having a second groove formed in said grooved surface, said projecting part of said ~~optical~~ quartz substrate comprising a first projecting part, said optical substrate having a second projecting part resting within said second groove so as to align said lens element and said optical element.

20. (Previously Presented) The optical device of claim 19, wherein said supporting substrate has a third groove formed in said grooved surface parallel to said first groove and said second groove, said optical element comprising an optical fiber arranged in said third groove.

21. (Currently Amended) The optical device of claim 17, wherein said supporting substrate has a side adjacent to said ~~optical~~ quartz substrate, said groove formed in said grooved surface extending to said side.

22. (Previously Presented) The optical device of claim 21, wherein said groove formed in said grooved surface comprises a first groove, said supporting substrate having a second groove formed in said grooved surface parallel to said first groove and extending to said side, said optical element comprising an optical fiber arranged in said second groove.

23. (Currently Amended) The optical device of claim 21, wherein said groove formed in said grooved surface comprises a first groove, said supporting substrate having a second groove and a third groove formed in said grooved surface, both said second groove and said third groove being formed parallel to said first groove and extending to said side, said projecting part of said ~~optical~~ quartz substrate comprising a first projecting part, said ~~optical~~ quartz substrate having a second projecting part resting within said second groove, and said optical element comprising an optical fiber arranged in said third groove.

24. (Previously Presented) The optical device of claim 17, wherein said supporting substrate is crystalline, and said groove formed in said grooved surface of said supporting substrate has a V-shaped cross section.

25. (Previously Presented) A method of forming the optical device of claim 24, comprising forming said grooved surface of said supporting substrate by etching said supporting substrate using an anisotropic etchant.

26. (Previously Presented) The optical device of claim 17, wherein said supporting substrate comprises:

a polymer substrate; and
a grooved resin layer arranged on said polymer substrate so as to form said grooved surface of said supporting substrate.

27. (Currently Amended) A method of forming ~~the optical device of claim 26~~ an optical device, comprising:

coating ~~said~~ a polymer substrate with a photosensitive resin layer;
selectively exposing said photosensitive resin layer to light through an exposure mask so as to cure exposed portions of said photosensitive resin layer; ~~and~~
removing uncured portions of said photosensitive resin layer so as to form ~~said grooved a groove in said~~ resin layer;
mounting an optical element on said polymer substrate;
forming a lens element on an optical substrate;
forming a projecting part on said optical substrate; and
connecting said optical substrate to said polymer substrate so that said projecting part rests within said groove, thereby aligning said lens element with said optical element.

28. (Currently Amended) The optical device of claim 17, wherein said projecting part extends perpendicularly from a surface of said ~~optical~~ quartz substrate and has a circular cross-section.

Claim 29 (Cancelled).

30. (Currently Amended) A method of forming ~~the optical device of claim 29~~ an optical device, comprising:

forming a lens element on a quartz substrate;

coating said quartz substrate with a photosensitive resin layer;
selectively exposing said photosensitive resin layer to light through an exposure mask so as to cure exposed portions of said photosensitive resin layer ~~corresponding to said projecting part;~~ and
removing uncured portions of said photosensitive resin layer so as to ~~form said~~ leave cured portions of said photosensitive resin layer as a projecting part;
forming a supporting substrate having a grooved surface with a groove formed therein;
mounting an optical element on said supporting substrate; and
connecting said quartz substrate to said supporting substrate so that said projecting part rests within said groove, thereby aligning said lens element with said optical element.

Claim 31 (Cancelled).

32. (Previously Presented) The optical device of claim 17, wherein said lens element comprises a computer-generated hologram.

33. (Currently Amended) The optical device of claim 17, wherein said lens element is fixed to said ~~optical~~ quartz substrate.

34. (Currently Amended) The optical device of claim 33, wherein said ~~optical~~ quartz substrate and said lens element are integrated to form a one-piece unit.

Claims 35 and 36 (Cancelled).